N.A.C.A. BULLETIN

In Three Sections

Section One

WHAT COST ACCOUNTING MEANS TO A PRODUCTION EXECUTIVE
by WALTER K. BAILEY 851

PRODUCTIVITY IN RELATION TO COSTS
by WILLIAM H. FRANKLIN 859

BUDGETARY CONTROL OF MANUFACTURING AND COMMERCIAL EXPENSE
by J. BROOKS HECKERT 869

VOL. XXVIII, NO. 14 MARCH 15, 1947

EDITORIAL DEPARTMENT NOTE

Industrial accounting is so broad and complex a field that there is no room for a feeling of complacency or stand-pattism on the part of those engaged in it. The need is for continuous progress and improvement. Constructive criticism should be welcomed by industrial accountants as a spur to this end. The first article in this issue of the *Bulletin*, in common with others published during recent months, serves to give the viewpoint of the industrial executive on the part that the industrial accountant should play in the management of industrial companies and the effectiveness with which he is playing his role.

WALTER K. BAILEY, the author of this article, is Vice President in charge of Operations of the Warner & Swasey Co., manufacturers of heavy machine tools. Starting with his company 27 years ago as salesman at a branch office, Mr. Bailey has progressed to his present position through such positions as District Manager for Cleveland and Sales Manager for the company.

•

There has been much discussion of late about the productivity of labor and its relation to costs and prices. In the second article in this issue of the *Bulletin* the author discusses the accountant's part in the problem of increasing labor productivity, first through a change in present production methods, and second without a change in method.

WILLIAM H. FRANKLIN, the author of this article, will be remembered by readers of the *Bulletin* as the author of two earlier articles with provocative titles: "Men Were Deceivers Ever" and "There's No Accounting for Profits." Mr. Franklin is Controller of the Caterpillar Tractor Co., a member of the N. A. C. A. National Board and Committee on Research, and Chairman of the Technical Program Committee for the 1947 International Cost Conference.

•

It would be difficult to assess the effect of the war period on budgeting practice in American industry. Certainly it is true that the incentives for budgetary planning and control were much less than in more normal times, with the allocation of output replacing sales forecasting in many cases, and production volume replacing cost control as management's number one objective. With the lessening of the wartime influences and the early return of a buyers' market in prospect, managements and accountants are again concerned with the improvement and utilization of budgetary control methods. Our third article discusses the advantages of budgeting and outlines procedures for the control of manufacturing and commercial expenses.

J. BROOKS HECKERT, the author of this article, is Associate Professor of Accounting at Ohio State University. Professor Heckert is well known in accounting circles for his textbooks on accounting systems, distribution cost, and budgeting, the last named published during the past year. He has long been an active member of N. A. C. A. He participated in the organization of the Columbus Chapter and served as its President in 1928-29. A former member of the N. A. C. A. National Board, and a frequent speaker at chapter and National meetings, Professor Heckert is presently serving as a member of the Board of Governors of the Spot Club of N. A. C. A.

This *Bulletin* is published semimonthly by the National Association of Cost Accountants, 385 Madison Ave., New York 17, N. Y. Subscription price, $10.00 per year. Entered at the Post Office, New York, N. Y., as second-class matter August 28, 1925, under the Act of March 3, 1879.

COPYRIGHTED BY THE
NATIONAL ASSOCIATION OF
COST ACCOUNTANTS

MARCH 15, 1947

WHAT COST ACCOUNTING MEANS TO A PRODUCTION EXECUTIVE*

by WALTER K. BAILEY, Vice President,
Warner & Swasey Co., Cleveland, Ohio.

I AM not a cost accountant; I never have been. I have only a fair idea of what cost accounting is and how it is handled. In fact, until fairly recently I never even had any definite contact with a cost accounting department or with the work done in cost accounting. However, it is necessary for me to depend to a very large extent upon information furnished by cost accounting, and other people in other organizations must have problems similar to mine. Therefore, my comments, which should be taken as an effort at constructive criticism, may be refreshing, and I hope they may even be stimulating.

Definition of Cost Accounting

When I agreed to talk to you I realized that I did not have a very accurate definition of what a cost accountant is supposed to be, even though I had a fairly accurate knowledge of what our cost accountants are trying to do. So last Sunday evening I examined the Encyclopedia Britannica. And, gentlemen, it may be disappointing to you to know that the subject of cost accounting is not covered in the Encyclopedia Britannica. They devote at least six pages to the cost of living, and one paragraph to the cost of production, but they do not cover the subject of cost accounting. I then turned to the subject of accounting as covered in the Encyclopedia and could find no reference to cost accounting or cost accountants, as such.

This made me feel a little better, because if the Encyclopedia Britannica didn't wish to define cost accounting maybe there was some excuse for my not being able to define it accurately. Continuing my research and taking the unabridged dictionary, I read everything it said about accounts, accounting, and accountants. I also read everything it said about costs, and to my delight I found a definition of cost accounting as follows: "Any system of accounts which reveals the cost elements of material, labor, and overhead incident to the production and distribution of a commodity."

* Talk before Cleveland Chapter of N. A. C. A. on the occasion of their visit to The Warner & Swasey Co. plant, Oct. 29, 1946.

Upon examination I found the definition of commodity to be "everything that is movable and is bought and sold."

Looking for still more information, I turned to the World Book, an encyclopedia designed and developed particularly for children, which I find usually has a better coverage of any subject and one which I can understand. There I found almost a full page devoted to the subject of cost accounting. I would like to add that I could understand nearly every word of that discussion because, of course, it had been prepared for a twelve-year-old mind. Here, also, was a definition that was of value to me: "The purpose of cost accounting in a manufacturing business is to determine the cost of producing and selling a commodity."

After studying these two definitions which emphasize the fact that cost accounting furnishes the factual data upon which decisions can be made in operating a business, and upon thinking of the function of cost departments as I have seen them operate, I want to call attention to one fact that I believe to be significant in these definitions. In both of these definitions the present tense is used, and not the past tense. From the operating standpoint of a business, the purpose is not to determine what it *did* cost to produce and sell—the purpose is to determine what it *is* costing to produce and sell, and to help estimate for the future what it *will* cost to produce and sell.

I wonder in this changing industrial world how well you stand up to that part of the definition. I wonder how well your figures have kept up with the explosion that took place in costs last spring. I wonder how accurate are the yardsticks that you are furnishing the management of your companies, and if those yardsticks are not more important as yardsticks than the mathematical accuracy with which you review past accomplishments?

Guide to Future

By this time you will have realized that I am more interested in the accuracy of current events and the predicting of future events than I am in a yearly statement. I do not want in any way to belittle the importance of a review of the past, and I recognize that this information is very important in judging trends for the future. But it happens that in this company I am one of the men who must make decisions that affect the future, and I am old-fashioned enough to believe that if we can know where we are day by day we will know where we are at the end of the year, and

we are more apt to know where we will be a few months and even a few years from now.

To put it bluntly, as an operating man I must make decisions effective in the future, and I would rather have a reasonably accurate picture of what we are doing now on a project than a precise and mathematical picture of what we did last spring. Let me raise the question as to whether the fetish of mathematical accuracy does not obscure the true purpose of cost accounting; namely, to furnish current information to help in guiding the future course of business.

Perhaps I am overly sensitive on this subject because of the present problems of this company, but I also realize that the present problems are going to be duplicated many times over during the next four or five years. Perhaps I am too naive, or perhaps I expect too much, but let me assure you that I am not talking about a more elaborate, a more detailed, a more expanded cost system for our plant. We have 12,000 to 14,000 production orders in process in this shop continually. The average number of pieces is somewhere between thirteen and fifteen, and I am quite sure an elaboration of the system in order to obtain still more detailed information would result in further delay in obtaining information.

Measuring Performance

What I am talking about are better yardsticks of measurement of current operation. Micrometer measurements are not necessary. I am firmly of the belief that if the general proportions of a picture are not right, then the details will be wrong. I am equally firm in my belief that if we can obtain a general picture that is correct there will be little trouble in fitting in the details.

At this point I am going to talk about things which some may say come outside the field of cost accounting. I do not believe they come outside the field of cost accounting as I have defined it. I am bringing up some questions because I believe that the best source for information on these questions lies with the cost accounting departments, and because I believe that if cost accounting departments could obtain some of the answers they would broaden their field of operation and greatly increase their value, and therefore create new opportunities for people.

What I suggest is that cost accountants, or at least some people in cost accounting departments, take a broader view of costs and cost accounting. I mean that in addition to compiling factual data,

you also furnish management with a current picture. Perhaps I can describe it by saying that you should furnish a picture of the forest as well as detailed specifications of the individual trees. Or, carrying it over into the language of business, a picture showing a total machine instead of one concentrating on the individual pieces and parts.

For example, I do not want to be told that we are losing such and such on a job, when the figures are based on shipments made thirty days ago and on work that was done one to three months ago, when I know that at this time that job is going out the door at twice the previous rate and with one-third the people. Nor do I want to be told that a job is doing well when I know we are in trouble and nothing is going out the door and costs are piling up. I believe every person in my position has had similar experiences.

Again, I do not want to be told that we have lost money over a two-month period on a certain job and then find that on the next month we are credited with an abnormal profit because due to the necessary slowness in compiling accurate cost figures the job had been overcosted in shipments and then corrected.

When I ask for costs on a job I want a current picture, and many times that picture cannot be constructed from cost figures, no matter how accurate, that are sixty to ninety days old. Of course, the only accurate, complete costs will be those covering a period in the past, but I see no reason why cost accounting departments cannot also give their interpretation of what is happening as well as an accurate picture of what has happened.

I do not pretend to know how to devise such a system. I question if what I am talking about can be reduced to a system, because to a certain extent I am talking about judgment, and different people will arrive at their decisions in different ways. Certainly the people in the cost accounting department, more than anyone else in the business, are in a position to know what is happening at the moment, and to know the trends, and to check the present with the past.

Interpreting Trends

Perhaps what I am talking about is a broader view of the information that is already in hand; but the thing I want to point out is that the broader view can be based upon information which is more easily available to cost accounting than any other part of the business. Therefore, I believe there is an opportunity for the

cost accounting departments or for some cost accountants to make a definite additional contribution to the running of the business of which they are a part.

By now you have probably realized that I am not happy with a cost system that is producing a beautiful and complete accounting, unless there is some interpretation of that accounting which will give a picture of the trend of present operations and form a better basis for the prediction of future operations. I hope you realize that I recognize that such a picture cannot be presented in the terms of accuracy that you normally deal with, but I believe that it can be presented when it is recognized that the units of measurement can be in dollars, if not in cents, and in thousands, if not in hundreds, of dollars.

You may say, "He has a different problem because of new products." My answer to that is that I have to base my judgment day by day on such pictures; and as to new products, there is not a company represented in this room that hasn't new products or redesigned products. As to changes in cost, there is not a company represented in this room that is not having radical changes in cost. Such changes are part of the times, and the rate of change in all business is very rapid and will continue to be so.

I would not bring up all this if I did not believe that there are opportunities for cost accountants and for cost accounting of which you are not taking advantage. By this, I mean personal advantage. Isn't it a rather simple fact that if your function is to furnish information to help guide decisions, then the more useful that information, the more helpful it will be, and the more important will be your job? If someone has to take a broad view to interpret cost figures, who is in a better position to guide that broad view, and who has access to more information than the cost accountants?

New Product Costs

Now this brings me to the next subject—cost forecasting on new products. I simply cannot talk about forecasting without having first covered the problem of current costs and current information. You men have well proved that on an established article in production, past costs can be used to forecast future costs. I am of the belief that on a new article past experience on other jobs in the same plant can be used to indicate future experience.

Before any new product is started in the manufacturing process, an estimate of cost is obtained. This is not done by you men; it is done by a group of experienced estimators who for a given business can become very accurate from the standpoint of predicting the amount of material and the number of hours required to do a job after a volume of production has been obtained. Such estimating can reach a reasonable degree of accuracy, but it only indicates the cost after the job is in production. Now the questions that I need answered are:

1. How long before we reach those costs?
2. What will be our starting costs?
3. What will be our experience up to the time when the item is in production and we have attained the original estimated cost?

I am talking about the abnormal costs that always surround and become a part of the production costs on new items. Maybe this is a subject for the estimating and standards-setting departments, but I don't believe so. If they deal with it, they are using their judgment and they have no detailed records to go by. They do not have records of past experience, and at least as far as our organization is concerned, they have not wanted to make such estimates, and when they have been forced to do so, they have been universally bad. However, such records of past experience are available, and you men have them.

It is my belief that the cost accounting department can, by charting and plotting past experience on new jobs, develop a pattern for the business which can be of great value to the person who is projecting the necessary loss in order to get into production on a new product, or who is projecting a price sufficient to cover that loss. Let me outline the procedure to you. First, on a new product an estimate is made as to the ultimate volume of production; then, based upon that volume, an estimate is made as to the cost of material and the cost in hours. Then, based upon those basic items of cost, the cost accountant arrives at a dollar figure, applying expected wage rates, burdens, etc. You, of course, have to start with the dollar figures you are now using and in most cases those dollar figures are several months old. It is seldom that they are altered to reflect the effect on overhead costs of added production in your factory. That, however, is an item which you could correct very easily.

By this time there is developed an ultimate cost figure, and with the use of proper judgment a price can be arrived at and a decision can be made as to whether the item can be sold at that price, or additional price added, or the item dropped.

Development Costs

Now on any new item there is another phase that has to be estimated, and that is, what will be the experience and the expense between now and the time the scheduled volume production is reached? One thing is known definitely, and that is the cost of producing, in terms of amount of material and wages paid, would be greater during the period of developing the production program than after the scheduled production has been obtained. The question is not one of whether there will be additional costs; the question is—how much?

At this point someone, usually in my general position, has to guess as to what the cost will be on the first lot, the second lot, the third lot, or on the first month's production and the second and third month's production. I suppose everyone in my position has developed certain rules which work fairly well, but if you can give us any additional means of measuring this cost on past jobs and thereby forming a basis for predicting it on new jobs so that we can even slightly improve our accuracy, you will be doing a great thing for your companies.

For example, in our plant, on one job an underestimate of ten per cent on the excessive starting cost would have resulted in a loss over a six-month period that would have required nine months of profitable operation to overcome. During the war the problem was simple. If there was any question, you went to the higher figure and readjusted the price at a later time. Under a free market and under normal commercial conditions you cannot follow that course because you would not get the business. As a further example, you saw this afternoon a knitting machine which, to anyone familiar with production, presents many problems the same as in building machine tools. I had to name a price for making the first seventy-five of those machines. The only yardstick I had to go on was the estimate covering what the production cost would be after we had learned how to do the job. I find now that if I had been guided by the experience on some totally dissimilar war work I would have made a more accurate estimate and would have arrived at a price which would have covered our cost on the first

seventy-five machines. Thus, the experience I have had to date leads me to believe there is a good deal of past experience that can be used to provide yardsticks for the estimating of starting costs on new jobs.

Importance of Forecast

The problem is not a theoretical one—it is actual. Again, to illustrate: I predicted in August that our shipment of knitting machines would show a profit in September, and on the fifteenth of October the cost accounting department proved that I was right. But during the first part of September I had to arrive at a price for the production of machines for the last three months of this year and for the first half of next year. I had to arrive at a price on a volume of business equal to approximately one-fourth of our total production, and it had to be done at a time when we were still producing at a loss, and cost accounting in its normal sense could not deal with the future possibilities.

We have at present in the plant the beginning of a new line of automatic screw machines. In this case the price of the product is pretty well defined by a competitive market. All of the machines that we are going to ship during the next six months are now being worked on in our shop. At a time when we have shipped only a few machines at a heavy loss, we must decide immediately how many machines we are going to ship next April and put them into production. I know what the first lot of ten machines cost. I am fairly certain at what cost these machines can be produced next fall. The question is, how much of a loss can we afford to take in the meantime, and how much will it be? The same problems are presented by every new product regardless of whether it is in our plant or in yours.

Conclusion

Now I do not have a system whereby these questions can be answered. You are the cost accountants—not I. A study of the important details of business shows that past experience indicates what future experience would be. I hope I have convinced you that if such information is incomplete, an approximate answer would be of great value. I am convinced that the answer lies in taking the broad viewpoint as compared with the detailed. I am not asking that management be relieved of the responsibility of making its decisions. I am asking only for help.

PRODUCTIVITY IN RELATION TO COSTS

by WILLIAM H. FRANKLIN, Controller,
Caterpillar Tractor Co., Peoria, Ill.

MOST, if not all, of the present unbalance between cost and price must be corrected through a reduction in cost if business is to regain the profit ratios of prewar years which, Heaven knows, were low enough. One possibility is by reducing costs of labor, which means simply getting more for the labor dollar. Getting more for the labor dollar is nothing more than getting an increase in productivity. It is now commonly recognized that the problem of increasing labor productivity is an extremely broad subject. It touches upon every aspect of manufacturing, engineering, distribution, labor relations, public relations,—in short, upon almost every aspect of businesss. The accountant's place in this picture is equally broad, a fact not as commonly recognized as it should be. But broad as the subject is, it can be subdivided into two separate problems: (1) changing present methods in order to obtain increased productivity; and (2) obtaining increased productivity from present methods.

Changing Present Methods

The first problem is that of changing present methods in order to obtain increased productivity. The accountant is a very important cog in this wheel, for he, more than any other specialist in business, approaches business problems from the over-all company viewpoint. The salesman is usually interested only in sales, the engineer only in engineering, the plant superintendent only in manufacturing. The accountant, however, is interested in all these and in many more aspects of the entire business. The accountant is in the best position to investigate and coordinate the activities of all departments and in many companies the accountant is in charge of all procedures affecting more than one department.

Accountant's Role in Productivity

From this over-all viewpoint, the accountant can ask many questions. Does the company have proper procedures for obtaining and reviewing ideas for new methods? Is an employee suggestion plan advisable? If such a plan is in effect, is it working properly? If the company is large with a complex product, does it have a department or departments whose sole function is to inquire into new

methods and conduct research to develop new methods? If the company is small, does its management have constantly before it the problem of obtaining more efficient methods? Is the engineering department fully conscious of costs when it makes design changes? Does that department constantly review designs in order to seek out cost savings which can be effected through design changes? Are the activities of the engineering and manufacturing departments properly coordinated? Etc., etc.? The questions are legion and the possible cost savings arising from the proper approach are tremendous. Even though many of these questions are far outside the scope of the accountant and beyond his control, nevertheless, the accountant can serve his company well if he will approach this field diplomatically.

Once the company is wrestling with a specific problem, once it comes to a decision as to whether or not a specific change should be made, the accountant is called upon for a cost study. It is not too much to say that in these specific cases the accountant's cost finding is usually controlling, that the decision is made mainly upon the results of the cost finding.

How often the accountant has failed to make a proper cost finding under these circumstances! Too often the costs obtained from the company's cost system are given without thought and, therefore, without adjustment. Too often the accountant is too busy with the everyday problems of his own department to think this problem through, to give it the attention it deserves.

Costs of Alternatives

The normal request for a cost study from those engaged in planning cheaper methods of production is the cost to produce under two alternatives: one, the present method, and two, the proposed method. The request, then, is for an analysis of how much money will have to be spent in the future under each of two methods to obtain the same number of units of production. There are two aspects to this analysis, each of tremendous importance.

First, there is required the amount of money which will have to be spent under each of two methods. Clearly, this means out-of-pocket expenditure. Over-all overhead application used for inventory accounting, etc., will not do. Thus, assume the proposed new method under consideration is the introduction of a large, expensive, single-purpose machine tool to be used to perform an operation currently performed by hand. It is expected that the introduc-

tion of this tool will reduce the man hours required for this operation from eight hours per unit to one hour per unit. If overhead is applied in this illustration as an over-all percentage of direct labor, the cost finding will predict a reduction in overhead to one-eighth of present overhead. This prediction is patently absurd in view of the fact that the proposed method is to introduce an expensive, single-purpose machine tool entailing expensive tooling, maintenance, etc. What must be considered is actual out-of-pocket costs under each method and out-of-pocket costs only.

Future Costs

The second aspect of this cost finding is that it is dealing strictly with the future. How much money will have to be spent *in the future* under each of two methods to obtain the same number of units of production? What is needed is the out-of-pocket expense in the future; the past has nothing to do with the problem. Thus depreciation cost on machine tools already purchased and in use should be excluded from the cost finding.

Let us assume that under present methods the out-of-pocket expense of producing a certain unit is $100, excluding depreciation on the tools in use. Under present methods, then, the company would pay out $1,000,000 for the next 10,000 units produced (10,000 x $100). Let us assume further that a proposed new method of producing this unit involves the expenditure of $200,000 for new tools, which will have an estimated useful life of 10,000 units, and the discarding of the tools now in use. The out-of-pocket expense under the proposed new method is estimated to be $70, excluding the cost of the tools. Under the proposed new method, then, the out-of-pocket cost of producing 10,000 units would be 10,000 x $70 or $700,000, plus $200,000 for tools, or a total of $900,000. This expenditure is $100,000 less than the amount to be expended in the future under the present method and the company will, therefore, be $100,000 better off if it makes the change. You will notice I have said nothing regarding the depreciation cost of the tools currently in use, and I submit that the company will be $100,000 better off if it makes the change whether the depreciation on the tools in use is $100 or $1,000,000.

This same reasoning applies equally well to a consideration of the net book value of the asset to be retired if the proposed new method is adopted. Too many times companies have been deterred from making changes because of a loss in disposition of the

old assets which will be shown on the books of account. Under the above hypothetical illustration, however, the company would save $100,000 by changing to the proposed new method whether the net book value of the asset retired was $100 or $1,000,000.

Financial Position

I know I am in for an argument at this point. I have come to the conclusion, in effect, that if *future* out-of-pocket expense will be cheaper under a new method of production than under present methods, then it is best to switch to the new method even if it means discarding an investment of possibly millions of dollars. This startling result is arrived at because we have so far considered only one aspect of the problem: the relative cost. There is, of course, another aspect which must be considered: the financial ability of the company to make the change. A business with its entire capital tied up in facilities is obviously not in a good position financially to consider extensive purchase of new facilities in which and with which its product can be produced more cheaply. Many companies are forced, therefore, to retain more expensive methods of production even though it means less profit in the future until such time as capital has been freed for investment in new facilities.

Depreciation and Obsolescence

It will be quickly seen that the problem here is separate and distinct from the problem of cost finding in connection with a change to new methods. What has actually happened is that the facility currently in use has not been depreciated at a rapid enough rate. As a result the costs of the product produced in the past have been understated. We should, therefore, learn from this example, and in our cost findings as well as in our bookkeeping the depreciation rate used for the proposed new method of production should be sufficiently high to insure that there will be no repetition of our present predicament when the time arrives that the new facilities give way to still newer methods. Otherwise, a company will find itself continuously changing to new methods and continuously throwing away unused capital investment until it is bankrupt.

Even though accountants have tended to use what might be considered high depreciation rates, I do not feel they have been in many cases nearly high enough. We are all of us too apt to look only at physical life and discount the vastly more important proba-

bility, if not certainty, of early obsolescence. It is possible that many facilities are in use today, even though obsolete, because a sufficiently high enough depreciation rate has not been used.

The Bureau of Internal Revenue has, of course, exercised considerable restraint on depreciation rates, and if the high rates I recommend are not allowed for tax purposes part of the gain is siphoned off in taxes. A suggestion has been made, however, that the taxpayer be allowed to use whatever rates he pleases and we should all support this suggestion. It is not simply a device to save taxes in the immediate future; it is a device which, I believe, will aid companies in remaining liquid enough to do the job that lies ahead.

Depreciation and Sales Price

It may be argued that the use of a higher depreciation rate will not automatically lead to recapture of the higher depreciation cost in sales price, and in many cases this is undoubtedly true. Prices in individual companies are often set by competition and by other factors at levels which appear to have little direct relationship to cost. Prices in industries as a whole are, however, strongly influenced by costs of the industry as a whole. Therefore, recognition of the need for higher depreciation rates by entire industries will ultimately lead, I believe, to recapture of the higher cost in sales prices.

It also may be argued that higher depreciation rates, in so far as they lead to higher sales prices, will have an adverse effect on the economy as a whole, and that what the economy needs is lower not higher sales prices. The policy I here advocate will not, however, lead to higher sales prices, since I advocate keeping businesses liquid enough to permit changes to new methods which will reduce costs in spite of high depreciation rates. Since a cost reduction is contemplated, there should be no need for higher sales prices.

It should be noted that the use of higher depreciation rates will not single-handedly cause changes to new and more efficient methods of production. Top management must, of course, have enough imagination and nerve to make changes when changes are needed. The accountant can, however, remove a strong deterrent to making proper changes by the use of proper depreciation rates.

Increased Efficiency Under Present Methods

So much for the problem of changing present methods in order to obtain increased productivity. There is the equally important problem of obtaining increased productivity from present methods. We have heard much since the end of the war of the decreased efficiency of labor. How much of this talk has been mere opinion and how much is the result of a scientific measurement of efficiency I, for one, do not know. I do know, however, that it is a basic fact that before the problem of obtaining increased efficiency under present methods can even be tackled, it is necessary to know scientifically what productivity is being obtained.

Productivity and Time Study

The efficiency of direct labor can be measured most effectively by reference to a standard, usually a standard time of performance. The establishment of this standard is a specialized field in itself, but a field in which the accountant must take a very active interest. After all, under a standard cost system, now recognized as the most modern type of cost system for the majority of businesses, costs are based upon this measurement of labor efficiency.

I do not intend to voyage into the realm of the art of time study, but I thoroughly recommend to all accountants that they take this voyage at the earliest opportunity. The art, besides being intensely interesting, is of vital importance in determining and controlling labor efficiency.

The mere establishment of time allowances for direct labor operations is not, however, enough. There also must be established a system for reporting work done in the shop and the resulting efficiency. Finally, the system must be such that reports are furnished accurately and, above all, speedily. In our company we are currently developing a system of reporting whereby every foreman will find on his desk when he comes to work each morning a report of the efficiency of each man in his section on the previous day. The accountant is, of course, in the best position to establish and supervise a system such as this.

Placing Responsibility

Having compiled our record of labor efficiency, we should be slow to place the entire blame on the individual workman. Particularly under today's conditions, the fault often does not lie with the workman. He has been forced to wait for tools which were not

immediately available, or his machine is not in the best of repair, or material was not readily at hand, or he is new to the job. All these and many more factors lead to a decrease in efficiency which is beyond the control of the workman.

It follows, then, that productivity can be increased by alleviating these troubles in so far as possible, and the accountant can play a very important part in creating conditions ideal for maximum production.

It is easy to blame conditions beyond the control of management when tools are short or material is not available. Too often these interruptions to production are, in part at least, the result of faulty controls within the organization, a faulty system of production control, of tool storage and procurement, of purchasing and follow up. These weaknesses are often, if not usually, the result of poor procedures for handling paper work. The system is such that material and tools are not ordered in time, scrap is not properly reported and recorded, purchase requisitions bog down in the purchasing department, etc., etc.

Improving Procedures

Men developed and trained in manufacturing are notoriously impatient with paper work,—red tape, as they call it. They often do not appreciate the importance of a smoothly operating system and do not usually have the ability to design the proper procedures for handling the necessary paper work. Accountants, on the other hand, live and breathe paper work. It is the very staff of life of accounting records. Accountants have, therefore, a golden opportunity to sell their services to plant management, to aid in the establishment of proper procedures so that interruptions to production within the control of management are eliminated.

Too often, however, accountants have failed to capitalize on this opportunity because they have not taken the trouble to understand the problems confronting the plant. They have too often insisted that the plant do things in conformity with the bookkeeping system. Let us never forget that the bookkeeping system is supposed to record what has happened; it is not supposed to make things happen.

Improved Working Conditions

Moreover, in helping the workman to attain greater efficiency, we should not lose sight of such intangibles as improved working conditions. Accountants in the past have been, I feel, too quick to

discount the benefits of proper lighting and ventilation, proper rest rooms, yes, perhaps even music. It is too easy to see only the expense and to overlook the saving. The accountant is, of course, qualified to determine the expense of an improvement in working conditions, but he is no more qualified to judge the possible savings than is the advertising manager or the salesman or the traffic manager. Since he is not qualified he should refrain from undue criticism of such expenditures.

But discounting all the many impediments to production, it is safe to say that the actual efficiency of labor has declined and continues to decline. A man in charge of production in a large plant here in the Middle West recently told me that he had not yet been able to find any way to make the people in his plant *want* to do a good day's work. I believe this is unfortunately true almost everywhere. The pride in accomplishment that used to pervade a good portion of the working force of this country is being replaced by a pride in getting away with a lack of accomplishment. A good workman is often criticized by his fellow workmen rather than used as an example to emulate. The dignity of honest toil, of a day's work well done, is disappearing.

It must be admitted that too often in the past a good day's work was obtained from the workmen through fear; fear of losing his job and not being able to find another; fear of his foreman and of plant management; fear of a tomorrow without money, of an old age without means of support.

This fear has now been very largely dissipated and I, for one, hope that it never returns. But it has been replaced by—nothing.

Educating Workers

I do not know where the solution lies. Incentives may help; employment stabilization may help; I am no expert who can present here a ready-made solution to this problem which has the best minds in the country hanging on the ropes. I do know, however, the direction in which the solution lies and that is in the minds of the workmen themselves. We must convince the workmen that it is to their own self-interest to increase production and if that can ever be accomplished, the workmen will do the rest. In this campaign of education the accountant has an important, if not vital, role.

Perhaps the most common reaction of workmen to an exhortation for more production is that there is no reason why he should

work harder just to make more money for the company. They can see only the direct benefit to the company arising from increased production; they cannot see the indirect benefit to themselves.

Production and Consumption

Now it is a simple truth that anyone can understand that before anything can be purchased it must first be produced. It should not be difficult to convince the public that before they can buy a tractor, or an automobile, or an icebox, or a bottle of beer, that someone must first have produced that tractor, or that automobile, or that icebox, or that bottle of beer.

It is just as simple a corollary to that truth that the more goods that are produced in an hour of work, then the more goods that can be purchased with the payment for that hour of work. And this corollary follows whether or not there are 18½ cents per hour or 30 per cent or 100 per cent wage increases. If no more goods are produced in an hour of work, no more goods can be purchased with the payment for that hour of work. It is true that wage increases shift the balance of distribution; one group which obtains a wage increase benefits at the expense of another group which did not obtain a wage increase. But such a shift only calls for retaliation by the group injured and in the long run injures everyone. The only permanent benefit comes from increased production per hour. We must pound that story home.

But does the workman today even hear that story? National labor leaders have recently begun to talk about the necessity of increasing labor productivity, but this talk as yet has not even filtered down to the local labor leaders, to say nothing of the individual workmen. Too often the individual workmen are told to concentrate on wage increases, to slow down, to watch out for any attempt on the part of management to speed up the work. He is taught that there is a conflict of interests; that it is to management's advantage to speed up the work, to the workmen's advantage to slow it down.

Confusing Terminology

It is an unfortunate fact that the economics of business have been cluttered up for years with obscure and misleading accounting terminology. We have talked for years regarding our surpluses, our reserves, our net worth. Is it any wonder that the workmen

have been misled? In a union newspaper I saw recently a company's reserve for depreciation and surplus added together to demonstrate the vast fund of money available with which to pay wage increases. An individual not acquainted with accounting cannot very well be blamed for believing that that fund existed. Had it not been called a reserve and a surplus?

When we talk to the public we must talk to it in language which does not mislead it. Accounting language is all right for technicians just as the Latin names for diseases are all right for doctors. But when a doctor talks to us laymen we want him to "speak English." Just so, we must learn to "speak English" in our reports to the public.

We must in simple language point out the simple truth that the sales dollar and only the sales dollar pays the wage dollar, that without the sales dollar the wage dollar cannot be paid, that more sales dollars and only more sales dollars can create more wage dollars, and that more sales dollars obtained by higher sales prices in the end only decrease the value of the wage dollar. This story must be told in our annual reports, in our talks with the public, in private conversations, in every way possible, and accountants are in the best position to tell it.

If, then, in the end we can convince the workman that his stake in increased productivity is much greater even than the stake of the company; if we can convince him that although increased productivity increases profits it also increases real wages, increases the goods he can buy with his wage dollar; if we can convince him of this, then and only then will we have attained maximum productivity.

BUDGETARY CONTROL OF MANUFACTURING AND COMMERCIAL EXPENSE

by J. BROOKS HECKERT, Associate Professor of Accounting, Ohio State University, Columbus, O.

THERE is always a tendency on the part of the central management to think it is good, that it is doing a good job; yet we who see the inside with perhaps a broader purview than any other functional group, know that often it is not good. We see innumerable cases of inadequate intelligence, faulty reasoning, careless planning, bungling, and waste, even in the best managed companies. American industry has performed some miracles but it has also made some colossal mistakes. At present, the paramount responsibility of management is to plan its future operations with a view to stability of industrial employment.

Budgeting is the chief device by which management can meet this responsibility. It is formal long-term and short-term planning based on the highest intelligence that can be drawn both from within and without the company. The management of any company has not met its full responsibility if it does not have before it in black and white a long-term program looking at least five or ten years ahead, and an immediate program formally developed and expressed to the entire organization setting forth the detailed plans of the next few months or quarters. No one knows what percentage of American companies have such budgets, but of all the companies doing a volume in excess of one million dollars, I do not believe that ten per cent carefully and formally plan their operations. Moreover, I have little patience with the industrial accountant who feels that he cannot sell planning and control technique to management. He is either lazy, immersed in detail that could better be done by subordinates, unaware of the real function of an accounting executive, or utterly lacking in the ability to convince particular executives that he has something they need and want. It is always possible to start in a small way and prove the value as you go.

The specific advantages of budgeting, in the order of their importance, are summarized below.

Action Based on Study

Thorough investigation, study, and research should precede action. Perhaps the cardinal advantage of systematic budgeting

is that it tends to bring the executives to an early study of their problems and instills into the organization the habit of careful study before decision as to action. This is not easy to achieve. Intensive study is to many a distasteful exercise. Most of us prefer to postpone difficult decisions until necessity compels. Businesses, as individuals, tend to become opportunists, to wait until a decision is forced then turn quickly, often without time for careful study of the problems, in the direction offering the easiest immediate escape from their troubles.

If the executives, from general manager to foreman, know that their plans are to be formally expressed and that they will be charged with responsibility for their execution, they can be brought to an earlier and more intensive study of the problems at hand.

Cooperation

The assistance of the entire organization in determining the most profitable course must be enlisted. When budgeting is undertaken in ample time and on a regular schedule, there is full opportunity to enlist the assistance of foremen, salesmen, branch managers, department heads, and all operating officials—major and minor. In some lines of business the suggestions and counsel from such sources are essential to the development of the best operating plans and in most lines of business such assistance is highly desirable. The final plans should be expressive of the combined judgment of the entire organization, thereby eliminating such bias or prejudice as frequently affects the judgment of individual groups.

Declaration of Policies

The budget serves as a declaration of policies. Nothing so restrains the enthusiasm and energy of an organization as uncertainty. The budget procedure provides a vehicle through which basic policies are periodically re-examined, restated, and set forth as guiding principles for the organization at large. Basic policies, not temporary expediency, should be the guiding factors of a business, and the organization should be schooled in such policies.

Defining Objectives

The successful manager must surround himself with capable associates who will accept his leadership and execute his program. But he must demonstrate his ability to lead. Men will follow a leader when they realize that he has a sensible plan of action and

definite objectives in mind. Such objectives should be clearly expressed, and, to a certain degree, should stand as goals of attainment for the entire organization. Objectives, however, must not be the product of hope but rather the logical consequence of carefully laid plans. The executive who can clearly define his objectives and delineate a program which can logically be expected to reach such objectives can command the cooperation and loyalty of his associates.

Coordination of Effort

In some respects this is the most important purpose of budgeting. In many concerns there is a definite lack of coordination of effort. This is a restraining factor. Full steam cannot be applied in some divisions of the business because of uncertainty as to the program in other divisions. Only when the effort of all divisions is properly timed and coordinated can the full power of united action be secured.

This, however, emphasizes another important element of business budgeting and that is the necessity of constant review and revision of the plans. If unforeseen and uncontrolled situations arise (and in many industries this is certain to happen), which materially alter the operations of one division, the machinery must be available for quick readjustment of the program in other divisions affected thereby. Wars, floods, drouths, strikes, price wars, political changes, collapse of foreign markets, etc. give rise to such situations.

The success of business budgeting should be measured not so much by the nearness of the ultimate results to the original plans as by the extent to which all executives, both major and minor, know at all times just what is the immediate program and what are their respective parts therein. There must be no uncertainty if the organization is to function with full power.

The chief executive is the final coordinating official but the complexities of the modern business are such that he cannot exercise this function without the assistance and guidance of clearly defined objectives and detailed plans which are projected throughout the entire organization.

Control of Operations and Employment

While the primary purpose of budgeting is to ascertain the most profitable source for the business to follow and to develop a bal-

anced and coordinated program which will hold the company to that course, the budget also provides a valuable tool of control over certain business operations.

Another advantage of the budget is to stabilize employment and to make more effective use of physical equipment. No employer of labor, regardless of his social or economic philosophy, can longer disregard the welfare of his employees. We have passed the time when laborers can be laid aside at will when not needed, as flasks or patterns in the foundry. To be sure, the responsibility to workers must be balanced with the responsibility to investors and the welfare of both must be considered, but the business program must consider stability of employment. Intelligent business budgeting rather than governmental regulation offers the greatest hope for providing stability of employment. Moreover, budgeting likewise promotes the economical use of physical equipment.

Budgeting Manufacturing Expenses

There are certain problems in the budgeting and control of manufacturing expense which are not encountered with material and labor. In the first place there are innumerable different items included in factory burden, usually many more than with material and labor; second, the responsibility for cost control is to some extent divided; and, third, not all of the burden costs can be expected to vary directly with volume.

Basically the problems are the same, namely, to determine the cost justified at various volume levels and to fix responsibility for any failure to hold the cost to the amount justified by the actual volume. The most successful method of accomplishing this is by establishing cost standards, but such a statement in relation to burden must be made with considerable reservation and qualification. Even in a small factory it is not practical to determine the exact number of feet, pounds, dozens, indirect hours, or other units of several thousand different supply and service items included in burden, which constitute standard consumption at various volume levels. Particularly is this true where numerous different items are manufactured and where the production varies considerably between periods.

I am not one of those enthusiasts who think that everything in business can be standardized, and that all we have to do in accounting is to sit back and wave a flag at management when somebody gets off the standard. Yet, in the end that is our primary

means of contributing to cost control. We must be enthusiasts for the determination and use of standards, but we must be sufficiently familiar with actual operations to direct that enthusiasm practically and with good sense. If one of our departments uses $1,000 worth of grinding wheels a month it is obviously essential, for purposes of cost control, to predetermine the consumption of wheels justified per unit or per thousand units of volume. But it is not sensible to try to predetermine the number of files and cold chisels needed by the maintenance department for miscellaneous repair jobs.

The problem is one of balance and usually we err in the direction of failure to carry individual burden cost standards as far as we should. Plants on the average can determine consumption standards for major individual variable burden items amounting to from 40 to 60 per cent of the total variable burden cost. The remaining items must be grouped and various composite standards established. They will not always serve as exact measurements, but they will be useful and will usually detect gross wastes. A common example is the relating of dollar cost of miscellaneous departmental supplies to labor hours.

Fixed and Variable Costs

Manufacturing expense consists of two distinct elements—variable and fixed. The only point of similarity between these elements is that their ultimate inclusion in the cost of the products manufactured is accomplished by means of apportionment rather than by direct charge. In all other respects they are entirely dissimilar. For example, variable costs vary in direct proportion to volume, fixed costs do not; variable costs can be assigned to operating periods with reasonable accuracy, fixed costs must be assigned by more or less arbitrary methods; the responsibility for variable costs lies chiefly with production operating heads, the responsibility for fixed costs is largely with general executives; variable cost assigned to an operating period is fully absorbed in the production cost of that period, fixed cost may or may not be so absorbed.

The failure to differentiate clearly between these two classes of burden items is responsible for much of the confusion and useless results of cost accounting. The customary procedure of cost accounting is to classify the production costs as direct material, direct labor, and burden.

The burden is usually applied to the product manufactured by means of all-inclusive burden rates which absorb both variable and fixed burden elements. Such a plan seldom gives satisfactory results. A far better plan is to subclassify the burden costs as to variable burden and fixed burden.

The distinction between variable and fixed burden elements should be maintained throughout the various steps in the costing process and extended to the valuation of finished goods. It would then be possible to ascertain what part of the cost and of the work in process and finished inventories consists of direct material and labor and variable burden, and what part represents an absorption of fixed costs. Such information is extremely useful in developing managerial policies. Such a plan of cost accounting requires the use of dual burden rates, one for variable burden and one for fixed burden, and the extension of such rates to all service and operating departments and to all production operations.

Classification of Burden Items

It is impossible to budget and control factory burden successfully without maintaining this distinction between variable and fixed costs; hence, the first step in the budgeting procedure is to so classify the costs. The following classification is illustrative of such items as usually fall within the two groups:

Variable manufacturing expenses

Supplies
Fuel
Power
Small tools expense
Spoilage, salvage, and reclamation expense
Receiving expense
Hauling within plant
Free repairs
Repairs to returns
Waiting time
Royalties
Variance of physical inventory from books
Factory traveling expenses
Consulting service
Testing expense
Communication expense
Overtime premium
Miscellaneous manufacturing expense

Fixed manufacturing expenses

1. Beyond the control of production executives:

Salaries of production executives
Depreciation
Taxes on real estate
Taxes on plant equipment
Insurance—property and liability
Taxes on factory inventory of materials, supplies, and work in process
Rent
Patent amortization
Pensions

2. Currently fixed by production executives:

- Factory administrative salaries
- Factory administrative expense
- Maintenance and repair of buildings and grounds
- Janitors, watchmen, and firemen
- Planning department expense
- Engineering department expense
- Research and development expense
- Committee expense (e.g., safety, welfare, cost reduction, etc.)

The following items contain both fixed and variable elements:

- Supervision
- Inspection and testing
- Payroll department expense
- Personnel department expense
- Factory office expense
- Stores and inventory expense
- Cost department expense
- Maintenance and repair of machinery and plant equipment
- Vacations
- Compensation insurance
- Health and accident insurance
- Social security taxes
- Industrial relations and welfare expense

It will be noted that fixed costs are further classified as to those which are beyond the usual control of production executives and those which are currently fixed by the production executives. Such a classification assists in the ultimate control of the fixed costs.

Semivariable Costs

Some items of manufacturing expenses are semivariable in nature. That is, they vary with volume of production but not in direct proportion to volume. This is often true, for example, of factory office and clerical expense. Again some items are fixed up to a certain point and are semivariable beyond that point. For example, a union contract may require one foreman as a minimum in a certain department, regardless of volume, and the addition of assistant foremen as the number of employees increases to certain points.

There are two general methods which may be used in the budgeting and control of these semivariable costs. First, it may be determined for each such item in each department what its costs should be at various levels of operation. Costs are then budgeted for the level of production operations expected. Periodically then the actual costs can be checked against what the cost should have been for the actual volume level of operations.

The second general method which may be applied to the budgeting and control of semivariable burden items is to resolve each such item into its variable and fixed elements. This procedure is simplified by the fact that the period for which the production budget is being prepared is comparatively short (usually a year or less), and the volume expectancy of a particular department can usually be reduced to a comparatively small range. For example, it may be fairly certain that a particular department will range between sixty per cent and eighty per cent of capacity (as measured by the selected index). The necessary costs at the upper and lower levels of an individual cost item, such as supervision, are then determined. The cost at the lower level may be considered as the fixed element of the cost and the difference between the two as the variable element. To illustrate, assume that a minimum supervision cost of $6,000 per month will be required in a certain department when operating at a volume level of sixty per cent and that this will gradually increase to $7,200 at a volume level of eighty per cent. The cost to be budgeted at various intermediate volume levels would then be:

Volume level	*Fixed cost*	*Variable cost*	*Total cost*
60%	$6,000	None	$6,000
65%	6,000	$300	6,300
70%	6,000	600	6,600
75%	6,000	900	6,900
80%	6,000	1,200	7,200

The variable element of the costs may not always increase in the same even progression with volume, but with most burden items it will so nearly follow as to make this method widely applicable.

As a practical working plan there is much to be said for this method. It reduces the burden to two basic types of costs which can be applied by the distinct burden rates. The classification of cost items given above follows this method. Here portions of the semi-variable costs are assigned to the variable and fixed groups.

Special Problems of Fixed Costs

The budgeting and control of fixed burden costs present certain problems not encountered with variable costs. These may be summarized as follows:

1. Fixed costs are the result of commitments practically all of which extend beyond the budget period; hence, an allocation of these costs must be made as between periods.
2. Decision must be made as to what portion of the fixed cost, allocated to a particular period, is to be absorbed by the production of that period.
3. The responsibility for fixed costs is usually with general or major production executives, whereas the responsibility for variable costs usually falls upon minor production executives.
4. Rigid control can be exercised over the fixed expenditures whereas the variable expenditures must be flexible.

Budgeting and Control of Distribution Costs

Can distribution costs be analyzed in such manner as to provide a sound basis for the direction of distribution effort and the control of its cost and, if so, how? The answer is both that they can be and must be. The task lacks much of being accomplished in American industry but it can be accomplished by the joint effort and ingenuity of marketing and accounting executives.

There are three methods of analyzing distribution costs:

1. By the nature of cost items or object of expenditure.
2. By functions or functional operations performed.
3. By the manner in which the distribution effort is applied.

In most concerns it is necessary to apply all methods, at least to some extent, in order to supply marketing executives with the information necessary for the efficient direction and control of distribution effort.

Analysis by Nature of Items

Such a classification of cost items is usually made a part of the ledger accounts themselves and forms the basis of subsequent analysis. Thus salaries, advertising, supplies, taxes, traveling expense, etc., are recorded separately.

An analysis by nature of cost items provides some general information for cost control purposes. If, for example, traveling expense is recorded in a separate account, it is possible to compare the ratio of the expense to sales volume for different periods. Such comparisons and relationships may reveal weaknesses if they

are extreme; but they will not reveal the fact that the cost per mile of operating salesmen's automobiles is excessive or that many calls are being made on customers whose business, actual or potential, cannot possibly justify the traveling expense involved. Again, it is possible by such analysis to ascertain the percentage of advertising cost to sales; but if this appears excessive, it is not possible to tell what adjustments should be made to effect a saitsfactory relationship. By this type of analysis it is possible only to ascertain the cost of the distribution function as a whole. But too many executives know merely how much it costs to carry on business as a whole, without knowing the cost of performing specific operations or securing particular results.

Analysis by Functional Operations

The second type of analysis is by functions or functional operations. Here it is necessary first to resolve the distribution activity into specific functional operations. The following are illustrative of a few such operations in a wholesale house:

1. Typing country mail orders of ten lines and over.
2. Registering country orders.
3. Order picking.
4. Packing, weighing, and stamping parcel post.
5. Opening and checking cases of assorted merchandise.
6. Computing freight equalization.
7. Salesman's call.

Having established such functional operations, a standard cost must be established for each operation. The procedure then is the same as that commonly used with production costs; namely, actual costs are determined and adverse variances are reported and corrected.

The functional analysis not only serves as a control device but also facilitates the analysis of costs by manner of application. Thus if an analysis is being made by classes of customers, it is necessary only to record the number of units of a certain functional service applied to a particular class of customers, and multiply this number by the functional unit cost, to determine the share of the functional cost applicable to that class of customers. While this method can seldom be extended to all distribution costs, it is applicable to a considerable part of the costs.

Analysis by Manner of Application

The third method of analysis of distribution cost is one which may be termed by manner of application. It is a determination of the direction which is being given to the distribution effort. Distribution effort, even though efficiently exercised, is unproductive unless given proper direction. Ultimately it is necessary to extend the cost analysis to a point which reveals the manner in which the distribution effort is being applied. This is necessary in order to relate effort and cost of results obtained, to adjust the effort to sales possibilities, and to balance properly the distribution factors.

This type of analysis determines the distribution cost of different territories, commodities, customers, channels, operating units, order sizes, etc. It is necessary for an individual concern to select from such possible analyses the ones which will give its operations proper direction. Frequently it is necessary to make cross-analyses; for example, costs may be analyzed by territories and the cost of each territory then further subdivided according to commodities or sizes of customer orders.

For the purpose of analysis by application, distribution costs may be divided into three major groups; direct costs, semidirect costs, and indirect costs. Direct costs, as the term implies, are those which can be definitely allocated. Thus, in an analysis by territories, the salaries of salesmen, who work exclusively in individual territories, are direct costs of those territories. The classification of accounts in itself usually expresses this direct relationship in some one direction.

Semidirect costs are those which are related in some measurable way to a particular analysis. The charges cannot be made immediately and directly, but a dependable basis of measurement is available. For example, the cost of packing may be distributed on the basis of physical volume; the cost of billing, on the basis of number of orders or number of lines of billing; or the cost of credit supervision, on the basis of the number of customers.

Indirect Costs

Indirect costs are those costs which admit of no measurable relationship with any one territory, product, or channel of distribution, as distinguished from any other. They are recognized as a general charge on the total business; and therefore, if they are apportioned, some arbitrary basis must be used. Examples of this type of expense are the salaries of general executives, and institutional

advertising. There may be, for example, no well defined relationship between institutional advertising and the sale of Product A as contrasted with Product B.

There is always a question as to the desirability of allocating indirect costs. The results obtained down to the point of these costs may be more useful for managerial purposes than an attempt to make a complete allocation. These costs may simply be considered as a residual group and management informed accordingly. Such a plan does not permit of final profit and loss determination for individual divisions, but the results, even if secured, are frequently of little value.

If a complete analysis of all costs is required, executives must be warned of the extent to which arbitrary allocation has been necessary. There are instances, however, in which the analysis must be complete, as for example, in the gathering of evidence for hearings before the Federal Trade Commission.

While there are some indirect cost items for which no measurable relation can be found, the amount of such costs is usually small. A diligent search into effort and result relationships will reveal that most distribution cost items have some ascertainable basis of apportionment.

Space does not permit a review of the methods which may be employed in analyzing costs by territories, classes of customers, commodities, order size, etc., but there have been a sufficient number of alert concerns who have made such analysis to demonstrate its practicability.

COMING ARTICLES

In the *N. A. C. A. Bulletin*, April 1, 1947

Accounting During Inflation and Deflation
by Perry Mason

Standard Cost System—Postwar Model
by William E. Perry

Cost Accounting's Role in the Management Picture
by F. J. Carr

N.A.C.A. BULLETIN

Section Three

RESEARCH SERIES NO. 9

TRENDS IN COST CONTROL PRACTICE

VOL. XXVIII, NO. 14 MARCH 15, 1947

FOREWORD

In any field of endeavor it is helpful now and then to take inventory—to review what has gone before, to survey the current scene, and to inquire what the future holds. Feeling that the early postwar period was an appropriate time for taking inventory in the field of cost control, the Committee on Research instituted a study of "Trends in Cost Control Practice," resulting in the report contained in this issue of the *Bulletin*.

This report is presented in three parts and provides: (1) an outline of what constituted good cost control practice in the period before the war and the stages by which prewar practice was developed; (2) a discussion of the nature of, and causes for, the decline in cost control activities during the war period; and (3) a list, with discussion and references to N. A. C. A. publications, of the steps which companies are taking to revitalize and improve their cost control activities for the days ahead.

CLINTON W. BENNETT, *Chairman,*
Committee on Research.

TRENDS IN COST CONTROL PRACTICE

NOW that American industry has been engaged for more than a year in the task of reconversion to a peacetime basis of production, the major trends in cost accounting which are likely to occur in the near future are becoming apparent. Feeling the need for more detailed information concerning the effect of the war on cost control activities and on plans developed in the early postwar period for making cost control work more effective, the Committee on Research directed that a study of recent trends in cost control practice be made. Members of the Committee contributed information concerning the wartime experience and the postwar cost control programs of the companies with which they are associated. These data have been supplemented by a limited number of interviews and by reference to recent publications by industrial accountants. The following paper presents a summary of the information obtained.

Cost Control Prior to the War

The theory and technique of cost control through the use of accounts was well developed and quite generally applied in the period before the war. An outline of what constituted good cost control practice in that period and of the stages by which prewar methods were developed will provide a background for consideration of wartime influences and postwar trends.

Cost control through the use of accounts as we know it today involves the accounting measurement of performance. Measurement presupposes some yardstick of desired or plannned results with which actual results can be compared. The evolution of cost control methods in the period before the war can be traced in terms of the types of goal figures used in measuring performance. During this period past costs, forecast budgets, cost standards, and flexible budgets were used as goals or measures for the evaluation of performance.

Before the day of standard costs and budgets, past costs provided the principal basis available for the measurement of cost performance. While the comparison of current with prior cost did serve to point out trends, the use of past costs as a measure of what costs should be had two important weaknesses. First, past costs constituted a good measure of what current costs should be only if the past costs represented good performance. Second, com-

parison with past results was valid only if current conditions were comparable to those which prevailed during the prior period. Changes in the rate of production and sales and changes in price levels were among the factors most likely to limit the value of past cost figures as measures of what current costs should be.

The development of budgetary control methods, based on a fixed budget or forecast of conditions expected to prevail in the coming period, provided goal figures which were to some extent an improvement over prior costs. Here the cost goals were prepared to reflect what the costs should be after the expected price and activity levels had been taken into consideration. The cost goals provided by these early efforts at budgeting were, however, predicated upon a single level of activity. If sales and production varied from the levels forecast, the budgeted costs were of doubtful validity as goals against which to measure accomplishment.

Concurrently with the beginning of budgeting for the financial control of business activities, the development of physical or engineering standards to provide control over the amount and quality of work done in the factory was taking place. These standards, expressed in terms of dollars, became cost standards. Since the method by which these cost standards were developed was one which emphasized careful inquiry to ascertain what it ought to cost to perform each operation by the best available method, cost standards provided more reliable goals toward which to work in control of current costs than did the goals previously available to management.

These cost standards were generally expressed in unit of activity form. With cost items whose total varied directly with activity, they could be applied without losing their significance as measures of good performance, regardless of fluctuations in activity experienced. However, in the case of factory and commercial overhead, where a combination of fixed and variable costs prevailed, there still was difficulty in measuring what costs should be at different rates of activity.

This shortcoming of standard costs was overcome by the flexible budget in which the relatively fixed components of cost were separated from variable components, and a technique developed which provided reliable goals or standards for control of costs at any rate of activity. The rather rapid adoption of flexible budget methods in the ten-year period prior to the war contributed much to the effectiveness of cost control methods.

Cost Classifications

Accompanying the development of standards and flexible budgets to provide better goal figures, there also have been improvements in the techniques of classifying and reporting costs. These latter changes have been of substantial aid to management in its use of standards to control costs.

Early cost systems were designed primarily to provide unit product costs for use in valuing inventories. Costs developed in this form made control difficult. The control of the total cost of a product or group of products is possible only through the control of the elements making up the total. Classification of costs by nature of the expenditure provides the initial breakdown which makes detailed control possible.

However, costs are controlled not by systems but by individuals. Hence costs must also be classified according to who in the organization has authority to incur the costs. Standard costs and flexible budget allowances which have been assigned to individuals on the basis of authority to control provide each individual with a measure of what he should spend to accomplish his task. When actual costs are classified on the same basis, the variances between actual and standard costs then serve as indicators of the effectiveness with which each individual's work has been performed. However, successful operation of this plan of cost control requires, first, an organization with clear-cut delineation of authority to incur costs and, second, the elimination from those costs for which an individual is held responsible of all items which are not controllable within the scope of authority delegated to him.

Control Reports

Along with improvements in the basic techniques which provide the kind of costs needed for control, there also has been a change in the content and emphasis of cost reports. Once sufficiently reliable standards had been put into use, and as long as conditions did not change materially, management no longer needed to concern itself with performance which conformed to the prescribed standard. Instead it was possible to concentrate upon the deviations from standards. Accordingly, cost reports for use in control were revised to emphasize the significant variances and in many cases to explain why the variances occurred. The value of timeliness was also stressed, for information in cost reports needed to be received in time to permit corrective action necessary before

unfavorable variances had cumulated into large losses. Hence cost control reports were prepared more frequently than previously.

In addition, it was recognized that in order to hold individuals responsible for the costs which they incur, it was necessary to provide them with the information they needed for the purpose. Thus cost reports were made much more widely available throughout the organization than they had been in earlier years.

In summary, it may be said that good cost control practice in the period before the war involved:

1. The classification of costs in terms of:
   a. Nature of expenditure
   b. Responsibility
   c. Variability
2. The predetermination of costs in the form of planned or standard costs and budgets.
3. The accumulation of actual costs.
4. The comparison of actual costs with the cost or budget standards in order to determine what variations had occurred and the causes of these variations.
5. The prompt reporting of variances to those individuals having authority to incur costs as well as to the next level of management.
6. Managerial action to eliminate unfavorable variances when actual costs differ from standard costs or budgets.

Effect of the War on Cost Control Methods

With the beginning of the defense program—and more definitely with the entry of this country into the war—the cost control techniques which had been developed in the prewar period and had attained quite widespread adoption began falling into disuse. Some companies, recognizing that excess costs represented wastes of short material and manpower, were able to retain some semblance of good cost control practice for a part of this period, but the general trend was to substitute cost finding for cost control. The influences responsible for this trend included the following:

a. *Absence of Normal Downward Pressure on Costs*

Costs have a natural tendency to rise. In normal times this is prevented by the downward pressure on selling prices from competition, and by the ever alert and strenuous efforts of management to prevent profits from being squeezed out be-

tween the lower and upper millstones. The unlimited demand for goods brought on by war removed the pressure of competition. This, coupled with the fact that profits were held by taxation and renegotiation to a fairly constant figure regardless of the efforts of management, had a natural tendency to divert the attention of management from cost control to other and more pressing problems.

b. *Emphasis on Production Speed and Volume*

Under the compulsion of total war, the volume and rate of output became more important than the cost. Companies were called upon to manufacture articles they had never made before. Volumes of output expanded far beyond any previous levels, while at the same time both product specifications and manufacturing processes were subject to constant change. Peacetime standards were no longer applicable, and new standards could not be developed fast enough to keep pace with the changes in production. This rapid expansion and shift of production in the face of labor shortages and high turnover made cost control virtually impossible. As one accountant has said, "It was not the will to cost control that was lacking, so much as that conditions made it impossible."

c. *Emphasis on Cost Finding for Reimbursement Purposes*

With the total demand for war goods exceeding the supply, price competition among suppliers was replaced by prices related to incurred cost. While the old type of cost-plus contracts were banned, cost-plus-fixed-fee contracts, renegotiation, and later contract termination required the detailed accumulation of actual costs as a basis for settlement with the Government. There was a consequent shift in many cases from standard costs for control and pricing purposes to actual costs for reimbursement purposes. Governmental emphasis later in the war on repricing and forward pricing indicated that standard costs would have been of considerable value for this purpose if retained and maintained, but in most cases the recognition came too late. The pressure was in the direction of cost finding and away from cost control.

d. *Deficiencies in Accounting Personnel*

With the wartime manpower shortage, accounting depart-

ments were confronted with manpower reductions and increased turnover in personnel. With cost control a marginal function for the reasons discussed above, and the reduced accounting personnel completely occupied with the essential financial and cost finding activities and with the wartime problems relating to priorities, labor problems, and government reports and controls, cost control activities suffered. In addition to the quantitative decline in personnel, the rapid turnover and consequent lack of trained technicians resulted in a qualitative decline. Under these conditions it was difficult, if not impossible, to revise standards and control budgets and keep them in line with rapidly changing production. The standards and control budgets, even if continued, lost their value for control purposes.

As a result of the presence of one or more of these influences, most companies experienced serious difficulties with cost control efforts during the war. While in most cases the tools of standard costs and budgets remained, yet in many cases they fell into disuse and in some cases they were scrapped. Where standards were continued without revision they lost their value for cost control purposes, but were used for cost finding purposes through the allocation of variances.

The Return to Cost Control

The influences which were responsible for the curtailment of cost control activities during the war years have been or are being eliminated or reduced. During the first postwar year the accumulated demand for goods and services, backed up by a wartime accumulation of purchasing power, has made possible the continuance of the pressure on production without too much regard for costs. But the end of the sellers' market is in sight, and its early replacement by a buyers' market ruled by price competition points to the need for renewed emphasis on the reduction and control of costs. At the same time, the ending of renegotiation and the elimination of excess profits taxes have removed or reduced the effect of these deterrents to economical operations. The substitution of civilian for government business has largely eliminated the need for cost finding for strictly reimbursement purposes. Manpower shortages are no longer such a restraining factor, although some time may be necessary to retrain accounting personnel along cost control lines.

With the elimination of these influences and the end of government price control, it is to be expected that business will soon again reach a position where profits will depend upon the reduction and control of costs rather than upon justifying selling price. Most companies already have taken steps to regain the ground lost during the war period and to improve on their prewar cost control methods.

All the evidence available would indicate that cost control methods in the near future will differ little from those used before the war. No important new tools or techniques have appeared during the war and early postwar period. The principal developments to be expected during the period immediately ahead are likely to be in the direction of (1) wider adoption of existing tools and techniques of cost control by companies which did not use them before, and (2) a more intensive use of them by the companies which have been in the forefront in their use.

The following quotation from a comment offered by one industrial accountant is perhaps representative of opinion concerning the trend in accounting for cost control during the next few years: "I think . . . there will not be many radical changes in cost control methods, as compared to prewar methods. There will be, however, a much greater emphasis upon all the techniques and methods of cost control which have been in effect for many years."

Improvements Planned

A limited survey of the present and contemplated actions by a few of the largest and most progressive companies has provided the following list of steps which are planned as a means of improving cost control results:*

1. *The review and revision of account classifications* to conform to the present organizational setup. During the early postwar period there have been many changes in the management structures of industrial companies. Account classifications and cost centers have been or are being revised to reflect the revised alignment of authority and responsibility.

2. *The revision of cost standards.* The nature and extent of the revisions made or contemplated by various companies vary

* For the use of those who may wish to refer to recent articles or case studies covering the activities listed, footnote references to N. A. C. A. publications in which such material may be found are given in Appendix A at the end of this paper.

considerably. Most companies have revised material price and labor rate standards to reflect current price and rate levels. At the same time some companies are retaining their prewar labor performance standard, even though current performance is considerably below standard. Standard or normal overhead rates are quite generally being revised to reflect the expectation of a higher ratio of output to capacity than prevailed for some years immediately prior to the war.

3. *The simplification of accounting routines,* including the elimination of repeated allocations and distributions. As expressed by one member of the Committee on Research, "Allocation to burden centers . . . can most easily be done once a year on a sheet of paper. There is no need to complicate the accounts with too many or too frequent distributions of expenses." In diversified manufacturing plants changes in processes or departments may require allocation more frequently than once a year.

4. *The greater mechanization of clerical operations.* The desire for more information at relatively less cost is leading many companies toward increased mechanization of clerical operations.

5. *More extensive use of long-range business planning.* Increased attention is being paid to long-range budgeting of plant additions, replacements, and capital requirements. Many firms expect to make substantial investments in new and improved manufacturing facilities during the next few years and hence are developing plans for the location, selection, and coordination of these facilities in order to reduce costs and to improve service to customers. Recognition is also being given to the need for methods of comparing performance with the results anticipated at the time the capital expenditures were approved.

6. *Continued growth in application of flexible budgets.* The use of the flexible or variable budget was increasing rapidly at the time the war forced a dropping of cost control activities. There is evidence to indicate that with the end of the war interest in the adoption and expansion of flexible budget methods has been revived, and that more and more companies will adopt this tool as the opportunity and the qualified manpower becomes available.

7. *The increased use of budgets in terms of physical units.* While reports of material usage and labor efficiency in terms of physical units (i.e., quantity of material consumed, hours of labor used, etc.) were fairly common before the war, the use of physical

units for the budgetary control of indirect costs was limited to a few companies and largely in the tryout stage at the beginning of the war. In spite of the difficulties involved in the development of budgets of this type, the greater ease with which operating personnel can comprehend budgets stated in terms of physical units points to the likelihood of increased use of this cost control tool.

8. *A wider recognition of the need for designing reports for the specific uses to which they are to be put.* In this connection a distinction is being made between routine reports and reports made as the result of special studies or to report on unusual and nonrecurring conditions.

9. *A tendency to speed up the preparation of reports* and an increased use of weekly and even daily reports. The preparation of prompt and frequent reports makes possible the elimination of the causes of unfavorable variances at the sources while the memory of the attendant conditions is still clear and before substantial losses can accumulate.

10. *Greater emphasis on staff help to the various executives* in translating facts into action as contrasted with the practice of submitting reports without interpretation.

11. *Increased use of the cost department to provide special analyses, reports, and suggestions* in connection with changes in products, prices, methods, and equipment used in both manufacturing and marketing. Decisions of this type, involving the control of costs at the source, require cost data prepared for the specific purpose, using the basic cost information which the cost department has available.

12. *Some renewed interest in the application of cost control activities to distribution is apparent,* although current interest appears to be only a preliminary to the activity which can be expected with the return of a buyers' market.

13. *The development by some companies of educational campaigns to sell cost control throughout their organizations.* It will take some time in the average company to regain the ground lost during the war, to instill in foremen and others the former interest in cost control and reduction, and to provide the necessary training.

It would appear, therefore, that while no new tools or techniques are in prospect, considerable effort will be devoted toward sharpening the tools already available and tightening up the control organization. These efforts will be directed principally along four lines:

(1) revision of basic costing procedures, (2) improvement of technical proficiency, (3) improvement of reports and the interpretation thereof, and (4) education to increase cost consciousness at all levels of supervision.

Revision of Basic Costing Procedures

During the war period procedures in many cost departments deteriorated until the accuracy of cost figures can seriously be questioned. The emergence of several large scale fraud cases also testified to the weakening of internal control systems. These results have come about partly through lack of attention to established safeguards upon which the accountant had previously relied to insure the accuracy of his figures, and partly through hastily made changes which were instituted without considering the effect of the changes on related procedures in the same or other departments. It is, of course, true that many of these changes were the result of shortages in staff or the necessity for action at a time when a complete study of the situation could not be made.

An essential step in tightening up controls will include, in many companies, a review of procedures through which the basic cost data flow to the cost department. It will be necessary to go beyond the figures and see whether the procedures which the company has established are really being followed and whether the controls are such as to insure reliable information in the circumstances under which the company now operates. Procedures instituted to meet wartime operating conditions may need revision now that operations are on a peacetime basis, unauthorized changes need to be eliminated, and makeshift procedures should be improved. Managerial action to secure compliance with a properly designed system of procedures will then insure the reliability of cost figures.

Improvement of Technical Proficiency

While the principles underlying the use of the accounting tools of cost control are well established, their effective use requires a high degree of technical proficiency and constant effort in studying and analyzing all phases of activity in a search for more accurate standards of measurement of every factor affecting costs. The effective use of the flexible budget is predicated on an adequate knowledge of the company's cost characteristics, and the dynamic nature of most industries requires that these characteristics be under constant study for signs of change. Such study in turn

requires an adequate cost classification in the accounting records.

To the extent that technical proficiency results from practice, the postwar period should witness a marked improvement because of the need for a reanalysis of cost data and a revision of standards to reflect postwar conditions. The dropping of standards during the war period, the introduction of new processes and methods, and the possibility of drastic changes in cost behavior require in many cases scrapping the accumulated knowledge of past cost patterns and the development of a new body of cost data. It is to be expected, therefore, that the exigencies of the changed situation will prevent the routinization of cost control accounting and that technical proficiency will benefit from the need for a fresh start.

Improvement of Reports and the Interpretation Thereof

Because of top management's dependence on reports for its knowledge of deviations from standard performance and the resulting need for either praise or blame, it follows that improvements in the construction and interpretation of performance reports constitute an important step toward more effective cost control. The survey previously referred to offers ample evidence of the recognition which progressive companies are giving to this area in their efforts to make cost control more effective. Better timing of reports, more emphasis on the accounting department's responsibility for sound interpretations, fuller recognition of the fact that reports must be adapted to the uses to which they are to be put, realization that there are different costs for different purposes, and the development of accounting methods to secure more information at relatively less expense are some of the objectives toward which effort is now being directed.

Education to Increase Cost Consciousness at All Levels of Management

In view of the fact that the primary control of costs rests with those who incur the costs or are responsible for the consumption of the materials and services representing costs, it follows that the success of control efforts rests largely on the degree of cost consciousness on the part of foremen, supervisors, and the junior executives who are in the front line of the company's activities. While top management in the successful companies is generally cost conscious, there appears to be need for much improvement in the lower levels of supervision.

There are today many foremen, supervisors, and others who have reached managerial rank since 1941 and these men have, for the most part, had little training in or experience with cost control. This, together with the general slackening of efficiency measures which occurred during the war, has motivated many concerns to develop training programs and meetings designed to teach these men what cost control means and how to use the tools and techniques. As a specific example of such efforts, one company reports that "Slide films and educational brochures portraying various systems in lay language have been used with excellent results. Seminar sessions are being held with factory supervisors. Liaison groups have been established to indoctrinate all supervision in cost control methods."

Another company states that "One of the main features of its present cost control program is an educational program designed to produce a cost conscious feeling among all personnel."

Both cost consciousness and the ability to understand reports must be developed. This requires a continuing program of education, the responsibility for which must rest in part on the accounting department. Much has been done in this field but the constant changes in supervisory personnel in a large organization require ceaseless effort in this direction. This is particularly true today because junior executives, like top management, lost much of their cost consciousness during the war period when costs in many cases were relatively unimportant.

The correct determination of the costs for which a given supervisor is responsible, the preparation of reports to indicate to him his performance, the practice of holding periodic cost control meetings, and the development of a sense of responsibility for successful performance are requisites in the postwar reestablishment of cost control.

In conclusion, it may be said that the wartime breakdown of established cost control systems did not indicate that they were fundamentally unsound. On the contrary, the results of their abandonment can readily be seen in the cost increases and lessened effectiveness of managerial control over costs which took place during the war. At a time when production was the prime objective, this was not serious, but with a return to peacetime conditions industrial accountants are generally agreed that costs must again be controlled if business firms are to survive in the expected era of renewed competition.

APPENDIX A

References to Recent N. A. C. A. Publications on Cost Control Methods

1. Revision of account classifications.

   Alexander MacGillivray, Accounting in a Decentralized Organization. September 1, 1946 *N. A. C. A. Bulletin.*

2. Revision of cost standards.

   Henry C. Perry, The Use of Costs in Establishing Selling Prices. 1946 *N. A. C. A. Year Book,* pp. 9-13.

3. Simplification of accounting routines.

   Ronald H. Robnett, Some Aspects of Overhead Distribution. October 1, 1946 *N. A. C. A. Bulletin.*

   Percy L. Procter, A Program for Improved Performance. 1946 *N. A. C. A. Year Book,* pp. 48-52.

4. Greater mechanization of clerical operations.

   Percy L. Procter, A Program for Improved Performance. 1946 *N. A. C. A. Year Book,* pp. 50-51.

5. More long-range business planning.

   R. G. Lochiel, Long-Term Profit Planning. 1946 *N. A. C. A. Year Book,* pp. 171-188.

   Herman C. Heiser, Putting Cost Accounting to Work—To Answer the $64 Questions. 1946 *N. A. C. A. Year Book,* pp. 143-157.

6. Growth in application of flexible budgets.

   T. R. Elsman, Profit-Action Figures. April 15, 1946 *N. A. C. A. Bulletin*

   Clinton W. Bennett, Postwar Cost Control Through Variable Budgets. *N. A. C. A. Anniversary Papers,* pp. 34-44.

7. Increased use of budgets in terms of physical units.

   David B. Caminez, Controlling Costs with Physical Unit Budgets. 1944 *N. A. C. A. Year Book,* pp. 143-169.

   David B. Caminez, Budgets for Cost Control. November 1, 1946 *N. A. C. A. Bulletin.*

8. Reports designed for specific uses.

   M. A. Moore, Postwar Reports for Executives, 1945 *N. A. C. A. Year Book,* pp. 128-154.

   Percy L. Procter, A Program for Improved Performance. 1946 *N. A. C. A. Yearbook,* pp. 52-55.

   Frank Wallace, Making the Figures Talk. 1946 *N. A. C. A. Year Book,* pp. 73-80.

9. Earlier and more frequent reports.

J. Hugh Jackson, Cost Accounting in the Education of Management. August 15, 1946 *N. A. C. A. Bulletin.*
Percy L. Procter, A Program for Improved Performance. 1946 *N. A. C. A. Year Book*, p. 52.

10. Staff help to executives.

Christian E. Zarchow, The Factory Accountant's Place in Management. February 15, 1946 *N. A. C. A. Bulletin.*
J. Hugh Jackson, The Growing Responsibility of the Accountant. May 15, 1945 *N. A. C. A. Bulletin.*
Henry C. Perry, The Use of Costs in Establishing Selling Prices. 1946 *N. A. C. A. Year Book*, pp. 17-18.
William E. Jones, Helping the Sales Executives. 1946 *N. A. C. A. Year Book*, pp. 19-30.
Frank Wallace, Making the Figures Talk, 1946 *N. A. C. A. Year Book*, p. 79.
Verne Breitenbucher, Putting Cost Accounting to Work—For Cost Control. 1946 *N. A. C. A. Year Book*, pp. 99-100.

11. Special analyses.

Percy L. Procter, A Program for Improved Performance. 1946 *N. A. C. A. Year Book*, p. 53.
Herman C. Heiser, Putting Cost Accounting to Work—To Answer the $64 Questions. 1946 *N. A. C. A. Year Book*, pp. 143-157.

12. Control of distribution costs.

Mason Smith, Industrial Accounting in a Competitive Economy. June 15, 1946 *N. A. C. A. Bulletin.*
Henry C. Perry, The Use of Costs in Establishing Selling Prices. 1946 *N. A. C. A. Year Book*, pp. 13-14.
William E. Jones, Helping the Sales Executive. 1946 *N. A. C. A. Year Book*, pp. 19-30.
Verne Breitenbucher, Putting Cost Accounting to Work—For Cost Control. 1946 *N. A. C. A. Year Book*, pp. 110-111.

13. Education in cost control.

Hugh J. Phillips, Jr., Training People for the Job. 1946 *N. A. C. A. Year Book*, pp. 59-72.

MEMBERS
N.A.C.A. COMMITTEE ON RESEARCH

Clinton W. Bennett, Partner, Cooley & Marvin, Boston, Mass., *Chairman.*

David R. Anderson, Comptroller, Kendall Co., Walpole, Mass.

W. M. Bechler, Assistant Controller, B. F. Goodrich Co., Akron, Ohio.

D. E. Browne, Comptroller, Lockheed Aircraft Corp., Burbank, Calif.

Eric A. Camman, Partner, Peat, Marwick, Mitchell & Co., New York, N. Y.

Thomas A. Dunbar, Comptroller, Boston Elevated Railway Co., Boston, Mass.

George Ellis, Secretary and Controller, Combustion Engineering Co., Inc., New York, N. Y.

W. H. Franklin, Controller, Caterpillar Tractor Co., Peoria, Ill.

E. Stewart Freeman, Company Auditor, Dennison Mfg. Co., Framingham, Mass.

Milton H. Friedberg, Partner, Milton H. Friedberg & Co., Bridgeport, Conn.

Col. H. A. Gidney, Vice President and Comptroller, Gulf Refining Co., Pittsburgh, Pa.

Howard C. Greer, Vice President and General Manager, Kingan & Co., Indianapolis, Ind.

Edward J. Hanley, Vice President, Secretary and Treasurer, Allegheny Ludlum Steel Corp., Brackenridge, Pa.

David Himmelblau, Chairman of Accounting Dept., School of Commerce, Northwestern University, Chicago, Ill.

Harry E. Howell, Controller, United Nations Relief and Rehabilitation Assn., Washington, D. C.

J. B. Inglis, Partner, Price, Waterhouse & Co., New York, N. Y.

J. Hugh Jackson, Dean, Graduate School of Business, Stanford University, Stanford, Calif.

Theodore Lang, Professor of Accounting, New York University, New York, N. Y.

Oscar N. Lindahl, Vice President, Carnegie-Illinois Steel Corp., Pittsburgh, Pa.

R. G. Lochiel, Vice President and Treasurer, Pennsylvania Central Airlines, Washington, D. C.

H. T. McAnly, Resident Partner, Ernst & Ernst, Chicago, Ill.

William F. Marsh, Partner, Lybrand, Ross Bros. & Montgomery, Pittsburgh, Pa.

Logan Monroe, Controller, Eaton Manufacturing Co., Cleveland, Ohio.

Martin A. Moore, Comptroller, Hyatt Bearings Division, General Motors Corp., Harrison, N. J.

Thomas H. Sanders, Professor of Accounting, Harvard Graduate Business School, Boston, Mass.

Harold Scott, Partner, Haskins & Sells, Detroit, Mich.

Roscoe Seybold, Vice President and Controller, Westinghouse Electric Corp., Pittsburgh, Pa.

Charles R. Stevenson, Partner, Stevenson, Jordan & Harrison, New York, N. Y.

George A. Ware, Controller, Cost Engineering Service, American Paper and Pulp Assn., New York, N. Y.

VOLUME 1 ISSUE 1